

What is claimed is:

1 1. A device for creating an opening in a target material, comprising:
2 a flexible material, with first and second sides, having two grooves that intersect on the
3 first side;
4 an explosive charge, positioned in substantial alignment with the grooves, on the second
5 side, not extending beyond a periphery of the flexible material; and,
6 initiating means, located proximately central to the explosive charge, to initiate the
7 explosive charge, creating an explosive force, wherein the explosive force, guided by the
8 grooves, penetrates the target material, creating a plurality of petals cantilevered from the target
9 material, substantially between ends of the grooves, to define a fragment-free opening in the
10 target material.

1 2. The device of claim 1, wherein the grooves comprise substantially orthogonal
2 positions.

1 3. The device of claim 2, wherein the explosive charge comprises placement at least
2 about one quarter inch from a periphery of the flexible material.

1 4. The device of claim 3, wherein the flexible material comprises a polymer material.

1 5. The device of claim 4, wherein the flexible material comprises a magnetic material.

1 6. The device of claim 3, wherein the explosive charge comprises a
2 Pentaerythritoltetranitrate based material.

1 7. The device of claim 6, wherein the explosive charge comprises a sheet explosive.

1 8. The device of claim 3, wherein the initiating means comprises a blasting cap.

1 9. The device of claim 8, further comprising a holder to hold the blasting cap in contact
2 with the explosive charge.

1 10. The device of claim 3, further comprising adhesive means to hold the device against
2 the target material.

1 11. The device of claim 3, further comprising a second material, placed on top of the
2 explosive charge to provide increased explosive force.

1 12. The device of claim 3, wherein the flexible material comprises a shape having a
2 center and four extending segments, each segment approximately equidistant from the other.

1 13. A device for creating an opening in a target material, having a first hardness,
2 comprising:

3 a cutting plate, having a second hardness being greater than the first hardness, with
4 orthogonal grooves on a front side;

5 a sheet of material, having a third harness being less than the second hardness and having
6 a surface area less than a surface area of the cutting plate, placed upon the cutting plate;

7 an explosive charge placed upon the sheet of material, positioned substantially along the
8 orthogonal grooves on the first side;

9 initiating means, located proximately central to the explosive charge, to initiate the
10 explosive charge, creating an explosive force that creates a plurality of petals cantilevered from
11 the cutting plate that drive into the target material, creating a plurality of petals cantilevered from
12 the target material to define a fragment-free opening in the target material.

1 14. The device of claim 13, wherein the cutting plate comprises a substantially square
2 shape.

1 15. The device of claim 14, wherein the cutting plate comprises a steel based material.

1 16. The device of claim 15, wherein the target material comprises an aluminum or steel
2 based material.

1 17. The device of claim 16, wherein the sheet of material comprises a polymer material.

1 18. A method of creating an opening in a target material, comprising the steps of:

2 providing a flexible material, with first and second sides, having two grooves that

3 intersect on the first side;

4 placing an explosive charge on the second side, positioned in substantial alignment with

5 the grooves, not extending beyond a periphery of the flexible material; and,

6 initiating the explosive charge to create an opening in the target material formed by

7 creating a plurality of petals cantilevered from the target material, substantially between ends of

8 the grooves, to define a fragment-free opening in the target material.

1 19. A method of creating an opening in an aluminum or steel based material, comprising

2 the steps of:

3 placing a sheet of steel based material on the aluminum or steel based material, the sheet

4 having substantially orthogonal grooves on a side away from the aluminum or steel based

5 material;

6 placing a second sheet, comprising a polymer material and having a surface area less than

7 a surface area of the sheet of steel based material, on the grooves;

8 placing an explosive charge on the second sheet, positioned in substantial alignment with

9 the grooves; and

10 initiating the explosive charge to create a fragment-free opening in the aluminum or steel

11 based material formed by edges of the sheet of steel based material punching through the

12 aluminum or steel creating a plurality of petals cantilevered from the aluminum or steel based

13 material.